

## Curriculum Vitae

### **Personal**

Name: Ester Yoles

Date of birth: 27.10.58

Place of birth: Israel

Marital Status: Married, 5 children

### **Education**

#### **Ph.D. *Cum Laudae***

1985-1990 - Neurobiology, Bar-Ilan University

Thesis: Effect of various physiological and pathological conditions on brain functions in newborn dogs.

Supervisor: Prof. Avram Mayevsky.

#### **M.Sc. 1982-1983 - Physiology, Bar-Ilan University**

Thesis: Development of cultured skeletal muscle cells in a chemically defined medium.

Supervisor: Prof. Sanford B. Sampson.

#### **B.Sc. 1979-1981 - Biology - Biochemistry, Bar-Ilan University**

### **Academic and personal experience**

2000-present: VP Product Research and Development, Proneuron Biotechnologies Inc.

In charge of:

- Research and development of cellular therapy for acute spinal cord injury. This product was in Phase II clinical development under FDA regulations.
- Research and development of therapeutic vaccines to treat neurodegenerative diseases.
- Writing and maintenance of Patents
- Member of upper management, determining company strategy and use of company resources to obtain strategic goals.

1993-2000: Assistant staff scientist.

Department of Neurobiology, Weizmann Institute of Science.

Research subject: "Physiological and immunological aspects of post-traumatic neuronal survival and regeneration".

1990- 1993: Postdoctoral fellow.

Department of Neurobiology, Weizmann Institute of Science.

Research subject: "Physiological aspects of post-traumatic neuronal survival".

1982-1989: Instructor in Biochemistry, General Physiology and Neurophysiology.

Department of Life-Science, Bar-Ilan University.

**Peer-reviewed publications or manuscripts in press (in chronological order).**

1. Yaniv Ziv, Arseny Finkelstein, Yona Geffen, Jonathan Kipnis, Igor Smirnov, Suzi Shpilman, Irena Vertkin, Michal Kimron, Aya Lange, Torsten Hecht, Klaus G. Reyman, Jonathan B. Marder, Michal Schwartz and Eti Yoles. A novel immune-based therapy for stroke induces neuroprotection and supports neurogenesis. *Stroke*. in press
2. Schwartz M, Yoles E. Immune-based therapy for spinal cord repair: autologous macrophages and beyond. *J Neurotrauma*. 2006 Mar-Apr;23(3-4):360-70.
3. Knoller N, Auerbach G, Fulga V, Zelig G, Attias J, Bakimer R, Marder JB, Yoles E, Belkin M, Schwartz M, Hadani M. Clinical experience using incubated autologous macrophages as a treatment for complete spinal cord injury: phase I study results. *J Neurosurg Spine*. 2005 Sep;3(3):173-81.
4. Schwartz M, Yoles E. Macrophages and dendritic cells treatment of spinal cord injury: from the bench to the clinic. *Acta Neurochir Suppl*. 2005;93:147-50.
5. Bomstein Y, Marder JB, Vitner K, Smirnov I, Lisaey G, Butovsky O, Fulga V, Yoles E. Features of skin-coincubated macrophages that promote recovery from spinal cord injury. *J Neuroimmunol*. 2003 Sep;142(1-2):10-6.
6. Hauben E, Gothilf A, Cohen A, Butovsky O, Nevo U, Smirnov I, Yoles E, Akselrod S, Schwartz M. Vaccination with dendritic cells pulsed with peptides of myelin basic protein promotes functional recovery from spinal cord injury. *J Neurosci*. 2003 Sep 24;23(25):8808-19.
7. Monsonego A, Beserman ZP, Kipnis J, Yoles E, Weiner HL, Schwartz M. Beneficial effect of orally administered myelin basic protein in EAE-susceptible Lewis rats in a model of acute CNS degeneration. *J Autoimmun*. 2003 Sep;21(2):131-8.
8. Kipnis J, Nevo U, Panikashvili D, Alexandrovich A, Yoles E, Akselrod S, Shohami E, Schwartz M. Therapeutic vaccination for closed head injury. *J Neurotrauma*. 2003 Jun;20(6):559-69.
9. Angelov DN, Waibel S, Guntinas-Lichius O, Lenzen M, Neiss WF, Tomov TL, Yoles E, Kipnis J, Schori H, Reuter A, Ludolph A, Schwartz M. Therapeutic vaccine for acute and chronic motor neuron diseases: implications for amyotrophic lateral sclerosis. *Proc Natl Acad Sci USA*. 2003 Apr 15;100(8):4790-5.
10. WoldeMussie E, Yoles E, Schwartz M, Ruiz G, Wheeler LA. Neuroprotective effect of memantine in different retinal injury models in rats. *J Glaucoma*. 2002 Dec;11(6):474-80.
11. Schori H, Yoles E, Wheeler LA, Raveh T, Kimchi A, Schwartz M. Immune-related mechanisms participating in resistance and susceptibility to glutamate toxicity. *Eur J Neurosci*. 2002 Aug;16(4):557-64.
12. Kipnis J, Mizrahi T, Yoles E, Ben-Nun A, Schwartz M. Myelin specific Th1 cells are necessary for post-traumatic protective autoimmunity. *J Neuroimmunol*. 2002 Sep;130(1-2):78-85.
13. Bakalash S, Kipnis J, Yoles E, Schwartz M. Resistance of retinal ganglion cells to an increase in intraocular pressure is immune-dependent. *Invest Ophthalmol Vis Sci*. 2002 Aug;43(8):2648-53.
14. Friedmann I, Hauben E, Yoles E, Kardash L, Schwartz M. T cell-mediated neuroprotection involves antithrombin activity. *J Neuroimmunol*. 2001 Dec 3;121(1-2):12-21.
15. Schori H, Yoles E, Schwartz M. T-cell-based immunity counteracts the potential toxicity of glutamate in the central nervous system. *J Neuroimmunol*. 2001 Oct 1;119(2):199-204.
16. Fisher J, Mizrahi T, Schori H, Yoles E, Levkovitch-Verbin H, Haggiag S, Revel M, Schwartz M. Increased post-traumatic survival of neurons in IL-6-knockout mice on a background of EAE susceptibility. *J Neuroimmunol*. 2001 Sep 3;119(1):1-9.

17. Kipnis J, Yoles E, Schori H, Hauben E, Shaked I, Schwartz M. Neuronal survival after CNS insult is determined by a genetically encoded autoimmune response. *J Neurosci*. 2001 Jul 1;21(13):4564-71.
18. Yoles E, Hauben E, Palgi O, Agranov E, Gothilf A, Cohen A, Kuchroo V, Cohen IR, Weiner H, Schwartz M. Protective autoimmunity is a physiological response to CNS trauma. *J Neurosci*. 2001 Jun 1;21(11):3740-8.
19. Yoles E, Friedmann I, Barouch R, Shani Y, Schwartz M. Self-Protective mechanism awakened by glutamate in retinal ganglion cells. *J Neurotrauma*. 2001 Mar;18(3):339-49.
20. Schori H, Kipnis J, Yoles E, WoldeMussie E, Ruiz G, Wheeler LA, Schwartz M. Vaccination for protection of retinal ganglion cells against death from glutamate cytotoxicity and ocular hypertension: implications for glaucoma. *Proc Natl Acad Sci U S A*. 2001 Mar 13;98(6):3398-403.
21. Friedmann I, Yoles E, Schwartz M. Thrombin attenuation is neuroprotective in the injured rat optic nerve. *J Neurochem*. 2001 Feb;76(3):641-9.
22. Fisher J, Levkovitch-Verbin H, Schori H, Yoles E, Butovsky O, Kaye JF, Ben-Nun A, Schwartz M. Vaccination for neuroprotection in the mouse optic nerve: implications for optic neuropathies. *J Neurosci*. 2001 Jan 1;21(1):136-42.
23. Nevo U, Hauben E, Yoles E, Agranov E, Akselrod S, Schwartz M, Neeman M. Diffusion anisotropy MRI for quantitative assessment of recovery in injured rat spinal cord. *Magn Reson Med*. 2001 Jan;45(1):1-9.
24. Levkovitch-Verbin H, Harris-Cerruti C, Groner Y, Wheeler LA, Schwartz M, Yoles E. RGC death in mice after optic nerve crush injury: oxidative stress and neuroprotection. *Invest Ophthalmol Vis Sci*. 2000 Dec;41(13):4169-74.
25. Yoles E, Zarchin N, Zurovsky Y, Mayevsky A. Metabolic and ionic responses to global brain ischemia in the newborn dog in vivo: II. Post-natal age aspects. *Neurol Res*. 2000 Sep;22(6):623-9.
26. Hauben E, Butovsky O, Nevo U, Yoles E, Moalem G, Agranov E, Mor F, Leibowitz-Amit R, Pevsner E, Akselrod S, Neeman M, Cohen IR, Schwartz M. Passive or active immunization with myelin basic protein promotes recovery from spinal cord contusion. *J Neurosci*. 2000 Sep 1;20(17):6421-30.
27. Yoles E, Zurovsky Y, Zarchin N, Mayevsky A. Brain metabolic and ionic responses to global brain ischemia in the newborn dog in vivo: 1. Methodological aspects. *Neurol Res*. 2000 Jul;22(5):505-11.
28. Yoles E, Zurovsky Y, Zarchin N, Mayevsky A. The effect of hyperbaric hyperoxia on brain function in the newborn dog in vivo. *Neurol Res*. 2000 Jun;22(4):404-8.
29. Kipnis J, Yoles E, Porat Z, Cohen A, Mor F, Sela M, Cohen IR, Schwartz M. T cell immunity to copolymer 1 confers neuroprotection on the damaged optic nerve: possible therapy for optic neuropathies. *Proc Natl Acad Sci U S A*. 2000 Jun 20;97(13):7446-51.
30. Schwartz M, Yoles E. Neuroprotection: a new treatment modality for glaucoma? *Curr Opin Ophthalmol*. 2000 Apr;11(2):107-11.
31. Moalem G, Yoles E, Leibowitz-Amit R, Muller-Gilor S, Mor F, Cohen IR, Schwartz M. Autoimmune T cells retard the loss of function in injured rat optic nerves. *J Neuroimmunol*. 2000 Jul 1;106(1-2):189-97.
32. Hauben E, Nevo U, Yoles E, Moalem G, Agranov E, Mor F, Akselrod S, Neeman M, Cohen IR, Schwartz M. Autoimmune T cells as potential neuroprotective therapy for spinal cord injury. *Lancet*. 2000 Jan 22;355(9200):286-7.
33. Schwartz M, Yoles E. Self-destructive and self-protective processes in the damaged optic nerve: implications for glaucoma. *Invest Ophthalmol Vis Sci*. 2000 Feb;41(2):349-51.
34. Schwartz M, Cohen I, Lazarov-Spiegler O, Moalem G, Yoles E. The remedy may lie in ourselves: prospects for immune cell therapy in central nervous system protection and repair. *J Mol Med*. 1999 Oct;77(10):713-7.

35. Yoles E, Zarchin N, Zurovsky Y, Guggenheimer-Furman E, Mayevsky A. Brain metabolic and ionic responses to systemic hypoxia in the newborn dog in vivo. *Neurol Res.* 1999 Dec;21(8):765-70.
36. Schwartz M, Yoles E, Levin LA. 'Axogenic' and 'somagenic' neurodegenerative diseases: definitions and therapeutic implications. *Mol Med Today.* 1999 Nov;5(11):470-3.
37. Schwartz M, Yoles E. Optic nerve degeneration and potential neuroprotection: implications for glaucoma. *Eur J Ophthalmol.* 1999 Jan-Mar;9 Suppl 1:S9-11.
38. Friedmann I, Faber-Elman A, Yoles E, Schwartz M. Injury-induced gelatinase and thrombin-like activities in regenerating and nonregenerating nervous systems. *FASEB J.* 1999 Mar;13(3):533-43.
39. Yoles E, Wheeler LA, Schwartz M. Alpha2-adrenoreceptor agonists are neuroprotective in a rat model of optic nerve degeneration. *Invest Ophthalmol Vis Sci.* 1999 Jan;40(1):65-73.
40. Moalem G, Leibowitz-Amit R, Yoles E, Mor F, Cohen IR, Schwartz M. Autoimmune T cells protect neurons from secondary degeneration after central nervous system axotomy. *Nat Med.* 1999 Jan;5(1):49-55.
41. Yoles E, Schwartz M. Degeneration of spared axons following partial white matter lesion: implications for optic nerve neuropathies. *Exp Neurol.* 1998 Sep;153(1):1-7.
42. Yoles E, Schwartz M. Elevation of intraocular glutamate levels in rats with partial lesion of the optic nerve. *Arch Ophthalmol.* 1998 Jul;116(7):906-10.
43. Rapalino O, Lazarov-Spiegler O, Agranov E, Velan GJ, Yoles E, Fraidakis M, Solomon A, Gepstein R, Katz A, Belkin M, Hadani M, Schwartz M. Implantation of stimulated homologous macrophages results in partial recovery of paraplegic rats. *Nat Med.* 1998 Jul;4(7):814-21.
44. Yoles E, Schwartz M. Potential neuroprotective therapy for glaucomatous optic neuropathy. *Surv Ophthalmol.* 1998 Jan-Feb;42(4):367-72.
45. Yoles E, Muller S, Schwartz M. NMDA-receptor antagonist protects neurons from secondary degeneration after partial optic nerve crush. *J Neurotrauma.* 1997 Sep;14(9):665-75. Erratum in: *J Neurotrauma* 1999 Apr;16(4):345.
46. Solomon AS, Lavie V, Hauben U, Monsonego A, Yoles E, Schwartz M. Complete transection of rat optic nerve while sparing the meninges and the vasculature: an experimental model for optic nerve neuropathy and trauma. *J Neurosci Methods.* 1996 Dec;70(1):21-5.
47. Schwartz M, Belkin M, Yoles E, Solomon A. Potential treatment modalities for glaucomatous neuropathy: neuroprotection and neuroregeneration. *J Glaucoma.* 1996 Dec;5(6):427-32.
48. Yoles E, Belkin M, Schwartz M. HU-211, a nonpsychotropic cannabinoid, produces short- and long-term neuroprotection after optic nerve axotomy. *J Neurotrauma.* 1996 Jan;13(1):49-57.
49. Eitan S, Solomon A, Lavie V, Yoles E, Hirschberg DL, Belkin M, Schwartz M. Recovery of visual response of injured adult rat optic nerves treated with transglutaminase. *Science.* 1994 Jun 17;264(5166):1764-8.
50. Hirschberg DL, Yoles E, Belkin M, Schwartz M. Inflammation after axonal injury has conflicting consequences for recovery of function: rescue of spared axons is impaired but regeneration is supported. *J Neuroimmunol.* 1994 Feb;50(1):9-16.
51. Zalish M, Lavie V, Duvdevani R, Yoles E, Schwartz M. Gangliosides attenuate axonal loss after optic nerve injury. *Retina.* 1993;13(2):145-7.
52. Yoles E, Zalish M, Lavie V, Duvdevani R, Ben-Bassat S, Schwartz M. GM1 reduces injury-induced metabolic deficits and degeneration in the rat optic nerve. *Invest Ophthalmol Vis Sci.* 1992 Dec;33(13):3586-91.
53. Yoles E, Zarchin N, Mayevsky A. Effects of age on the metabolic, ionic and electrical responses to anoxia in the newborn dog brain in vivo. *J Basic Clin Physiol Pharmacol.* 1991 Oct-Dec;2(4):297-313.

54. Mayevsky A, Duckrow RB, Yoles E, Zarchin N, Kaushausky D. Brain mitochondrial redox state, tissue haemodynamic and extracellular ion responses to four-vessel occlusion and spreading depression in the rat. *Neurol Res.* 1990 Dec;12(4):243-8.
55. Mayevsky A, Yoles E, Zarchin N, Kaushansky D. Brain vascular ionic and metabolic responses to ischemia in the Mongolian gerbil. *J Basic Clin Physiol Pharmacol.* 1990 Jan-Dec;1(1-4):207-20.
56. Mayevsky A, Yoles E, Zarchin N. Metabolic, ionic and electrical responses to oxygen deficiency in the newborn dog in vivo. *Adv Exp Med Biol.* 1986;200:261-9.
57. Sampson SR, Babila T, Disatnik MH, Shainberg A, Yoles E. Evidence for a functional role of acetylcholinesterase in cultured chick myotubes. *Brain Res.* 1983 Dec 19;